

Twenty minutes after midnight it began to travel along the balustrade of the veranda, taking at first a very undecided course, but as soon as it reached the edge of the balustrade making straight for the banana. Halfway it was turned aside by some fish-scales, which no doubt indicated that the surface was contaminated; but it soon regained its previous direction. Near the column it fell in with a grooved washing-board, which it seemed to remember, for it reared its head and tentacles towards it while still 2 centimetres off. So far 2 metres had been traversed in twenty minutes. The snail now advanced resolutely from the board to the flower-pot as if over known ground. (The board had lain in the same place for several days.) I watched its movements by a lamp set far off so as to give only a faint light; but when it reached the pot the animal became shaded by weeds which grew there, and I found it necessary to bring the lamp near, in order to observe the movements of the snail's lips and tentacles. It climbed the pot rapidly, mending its pace as it got nearer, then it examined the rim with care, and at last crawled over the mould. For a quarter of an hour it wandered among the weeds in the pot, licking them frequently. When I saw it explore the soil with its lips and larger tentacles, while the reproductive orifice seemed to open from time to time, I thought that it was seeking a convenient spot to lay its eggs. At last it came up to the banana, mounted it, and began to gnaw the leaf previously attacked exactly where it had left off before. I was standing a little way off to avoid disturbing the snail, but could readily detect the peculiar odour of the gnawed leaf. Very likely the snail could perceive, even in an uninjured leaf, that scent which only became apparent to me when the leaf was bruised or cut, and this may have helped to guide its course. Scent alone will not, however, explain all the movements of the animal. At 2 p.m. I left it feeding.

June 11.—At 10 a.m. very little of the leaf had been devoured. The snail was comfortably established, as before, between the column and the pot.

After this the snail wandered over a vine which trailed about the column and upper veranda. Finding that it was disposed to escape to the next garden, I opened it on June 17 to see whether it was ready to lay eggs. There was not a single egg in the oviduct, and a large dart in the dart-sac proved that no sexual congress had lately taken place.

These observations seem to show that a land-snail may possess an instinct which enables it to choose its abode and return to it at pleasure. We have here the same love of home and topographical knowledge which have been observed, and noted with wonder, in the limpet (George Roberts, in Woodward's 'Manual of Mollusca,' p. 11).—*Zoological Section of the Lisbon Museum, Oct. 27, 1885.*

On the Existence of a Postoral Band of Cilia in Gasteropod Veligers.
By J. PLAYFAIR M'MURRICH.

The question as to the phylogeny of the Mollusca is as yet undecided, though recent researches indicate a relationship between this group and that of the Annelida. The discovery of the peculiar

forms *Neomenia*, *Proneomenia*, and *Chaetoderma* gave a strong impulse to this idea on account of their similarity in some respects to what obtains in the Polyplacophora; but it is not safe to argue a direct descent from these forms, or even to imagine that they come into the ancestral line at all. It is quite possible that they and the Polyplacophora are offshoots from the direct stem, and probably we must look more to the embryological history of the Gasteropods for light on the subject. Attempts have been made, notably by Hatschek ('Studien ü. Entwicklungsgesch. d. Anneliden,' Wien, 1878), to trace a relationship between the *Polygordius*-larva of the Annelida and the Molluscan larva, and thus to throw any relationship which may exist between the two groups back to a very early period in their evolution.

If it can be shown that there is considerable similarity between the larvæ of the two groups, and if the differences which do exist can be explained as adaptations to new conditions, the presumption as to the genetic relations between the larvæ will be greatly strengthened. As regards the arrangement of the cilia, which is the only point to be dealt with in this note, we have in the *Polygordius*-larva a strong præoral locomotive band, a more delicate postoral nutritive band, and a still less apparent ciliated region lying between these two bands and leading into the ciliated mouth. The identity of the cilia of the velum of the Gasteropod larva with the first of these has been frequently noticed; they form a strong præoral band, occasionally double, and differing from the band of the *Polygordius*-larva only in the extent of its development, and in its incomplete closure in many cases dorsally. This latter point of difference does not, however, hold throughout; the former may be explained by the necessity for a more powerful locomotive apparatus than is required for the Annelida, caused by the presence of a shell, a structure which appears very early in the life-history of the Mollusca. A postoral band has never as yet been described for the Prosobranchs. Several observers have called attention to the presence of a single band of cilia behind the cilia of the velum, and have regarded it as nutritive in function, and the object of this note is to call attention to the fact that this band passes across the ventral surface of the larva behind the mouth, and is therefore quite comparable to the postoral band of the Trochophore. My attention was first called to this fact in the larvæ of *Crepidula fornicata*, and I was afterwards able to confirm it in those of *Fulgar carica*, in a species of *Neptunea*, in two Prosobranch Veligers as yet undetermined, and in the Opisthobranch *Montaguia*, sp.? In the undetermined Veligers the velum was produced into four long flattened arms, round the margins of which were the strong locomotor cilia. On the under surface of the arms, running parallel to and not very remote from the locomotor cilia, was the finer band of nutritive cilia, the transparency of the arms and their size rendering it very apparent, and it could without much difficulty be traced across the ventral surface of the body immediately behind the mouth. Dr. W. K. Brooks informs me that he noticed the existence of this postoral band some time ago, and was then inclined to attribute some phylo-

genetic importance to it; but being occupied with other investigations he did not follow up his observations, and refrained from publication. Haddon also has described and figured it for certain Opisthobranchs, but does not seem to have observed it in the Proso-branchs he studied.

The region between these two bands is occupied by numerous very fine cilia, which, as in the *Polygordius*-larva, are continuous with those lining the mouth-opening and the œsophagus. The arrangement of cilia which is to be found in the typical Annelid larva is therefore almost exactly reproduced in the Gasteropod Veliger.

Arguing from ontogeny, a phylogenetic history of the Gasteropods somewhat as follows may be constructed. They and the Annelida have had their origin in a Trochophore. In the Gasteropods this ancestor developed a univalve shell, represented by the larval shell so often replaced as development proceeds by another more ornamented and more complicated in structure. The development of this shell, by increasing the specific gravity of the animal, rendered the simple præoral cilia of the Trochophore insufficient for active locomotion, and the extent of the band was increased by the region of the body on which it occurred being as it were pulled out laterally, the characteristic velum being thus produced. Perhaps, too, in the presence of the shell, a reason can be found for the absence of metameric segmentation in the Gasteropods.—*Johns Hopkins University Circulars*, Oct. 1885, p. 5.

Results of a Faunistic Excursion in the Iser-, Riesen-, and Glatzer Gebirge. By Dr. OTTO ZACHARIAS.

With the aid of subventions from the Berlin Academy and the Silesian Society the author has made a second excursion in the region of the Iser-, Riesen-, and Glatzer Gebirge, and obtained some interesting results, especially in relation to the Turbellaria. He has ascertained positively that, as indicated more than fifty years ago by Draparnaud, Dalyell, and Dugès, at certain times reproduction by spontaneous transverse division takes place in many freshwater Planarians. In the Iser Gebirge he has found a *Polycelis cornuta*, apparently identical with that described by O. Schmidt (*Zeitschr. wiss. Zool.* x. 1860, pp. 25, 26), which propagates exclusively by transverse division. In a brook near Hirschberg he obtained *Planaria tentaculata*, Drap. (already observed by Dugès), which for weeks together reproduced by simple division, or rather by terminal gemmation. In this *Planaria* he ascertained by serial sections that there was not the smallest trace of either male or female sexual organs. He states, however, that during the autumn individuals occasionally appeared in which distinctly differentiated sexual organs were recognizable.

Dr. Zacharias has also investigated the minute anatomy of the Turbellaria, especially with respect to the exact course of the two lateral nerves and the innervation of the pharynx. His investigations were made upon a new species described by him under the name of *Monotus relictus* (*Zeitschr. wiss. Zool.* xli. 1885, p. 505). In this species he succeeded in ascertaining the whole course of the lateral nerves (from the cerebral ganglion to the posterior extremity